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In the present Office Action, claims 1, 38 and 40-49 were examined. Claims 1, 38 and 40-46 are rejected, no claims are objected to, and no claims are allowed.

By this Amendment, claim 42 has been amended, no claims have been canceled, and no claims have been added. Claims 47-49 have been withdrawn. Accordingly, claims 1, 38 and 40-46 are presented for further examination. No new matter has been added. By this Amendment, claims 1, 38 and 40-46 are believed to be in condition for allowance.

Rejections/Objections under 35 USC §112

The Examiner rejected claim 42, 45 and 46 under 35 U.S.C. §112, first paragraph as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the Examiner states that the weight ratio of from 1:20 to 20:1 of metal pyrithione relative to the metal or metal-containing compound is supported by the specification only when the metal is copper.

The specification of the present application provides support for claims 42, 45 and 46 on at least page 10, lines 1-15, and 23-29, alone or together with page 16, Example 4. These excerpts from the specification illustrate, by way of example using copper, that the weight ratio of metal pyrithione relative to the metal or metal-containing compound may be from 1:20 to 20:1. Accordingly, Applicants respectfully submit that support for this limitation is found in the present specification. Nonetheless, Applicants hereby amend claim 42 to require that the recited range of weight ratios apply only when the metal is copper. By virtue of this amendment, it is respectfully submitted that the outstanding rejection of the claims has been overcome. Entry of this amendment is respectfully requested since the amendment puts the claims in a better condition for allowance.

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Rejections under 35 USC §102

The Examiner rejected claims 1, 38, 40, 41, 43 and 44 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,916,947 to Morris, et al. Applicants respectfully submit that this rejection is untenable and should be withdrawn.

Morris, et al. discloses a particle mixture in powder or slurry form which exhibits antifouling properties when incorporated into a carrier comprising zinc oxide (Col. 2, lines 42-44). Additionally, Morris, et al. discloses a "preformulation step . . . which involves either subliming or solvent depositing the photosensitizer over the surfaces of the colloidal zinc oxide prior to suspending the zinc oxide pigment in the vehicle." (Col. 6, lines 10-14). The vehicle comprises a resin, one or more pigments, a suitable solvent for the resin, and various optional additives. (See Col. 5, lines 55-57).

The photosensitizer disclosed by Morris, et al. is preferably substantially insoluble in water, absorbs visible light, and catalyzes the production of peroxides when contacted with zinc oxide, water, oxygen and visible light. (Col. 3, lines 52-56). One of the seven photosensitizers named in Morris et al is zinc pyrithione, and it is the only pyrithione specified.

Paragraph 17 at page 7 of the outstanding Office Action states that Applicants distinguish over Morris et al based upon process limitations in product-by-process claims. However, the proper distinction lies in the product itself. More specifically, if zinc pyrithione is coated or sublimed onto zinc oxide as taught by Morris et al, it cannot form the instantly claimed product. The reason is that the ion that is common to both zinc oxide and zinc pyrithione, namely zinc ion, cannot transchelate with itself. There is no stability constant difference to cause transchelation. Thus, the Morris et al product is different from the instantly claimed product. The former provides a physical coating at the zinc pyrithione/zinc oxide interface whereas the latter contains a chemical reaction product at the shell/core interface. Accordingly, the instant claims are believed to be novel over the disclosure of Morris et al.

In contradistinction, the present invention discloses and claims a biocidal composition comprising composite particles wherein the shell contains metal pyrithione that is the reaction product with core metal.

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The core of the present invention comprises a metal or a metal-containing compound wherein the metal is a moiety selected from the group consisting of zinc, copper, bismuth, silver, zirconium and combinations thereof. The shell of the present invention contains a metal pyrrhione that is the reaction product of pyrrhione acid or a water-soluble salt of pyrrhione with a portion of the metal or metal-containing compound of the core. Morris, et al. does not disclose or suggest coating a metal moiety with a water-soluble salt of pyrrhione. On the contrary, Morris, et al. discloses coating colloidal zinc oxide with a water-insoluble photosensitizer. Accordingly, the coating of the surface of zinc oxide disclosed Morris, et al. does not provide a shell wherein the shell comprises the reaction product of a pyrrhione with a portion of the core metal or metal compound. Accordingly, the Morris et al product itself is different from, and not suggestive of, the instantly claimed product.

The inherency argument recited at page 6 of the outstanding Office Action is believed to be untenable. Therein it is stated that the Morris, et al. "particle complex which possess ingredients within the scope of the present invention would inherently possess the same physical parameters as presently claimed..." Applicants respectfully disagree. Morris, et al. discloses that patentees' photosensitizer can be only one salt of pyrrhione, namely zinc pyrrhione, as opposed to the instantly claimed "water soluble salt of pyrrhione". Since the zinc pyrrhione photosensitizer cannot transchelate with the zinc oxide disclosed in that reference due to the common zinc ion present, there can be no reaction of those two compounds. Therefore, the Morris et al product is different from the instantly claimed product.

It should be readily apparent that the chemical attributes of the instant composite particles are different from those of a colloidal zinc oxide physically covered with (as opposed to chemically reacted with) a photosensitizer because the instant shell comprises the reaction product of pyrrhione with a portion of the core. While zinc oxide and zinc pyrrhione of the Morris, et al. reference may provide a physical combination, they cannot react to provide a reaction product of pyrrhione with core metal as instantly claimed. Further Morris, et al. provides no suggestion or teaching in favor of such a chemical reaction. Accordingly, the instantly claimed composite particles are not disclosed or suggested by Morris, et al. Therefore,

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Applicants submit that the instant rejection of the claims under 35 U.S.C. §102(e) is untenable and should be withdrawn.

The Examiner rejected claims 1, 38, 40, 41, 43 and 44 under 35 USC §102(e) as being anticipated by U.S. Patent No. 6,162,446 to Hani, et al. Hani et al discloses a transchelation of zinc oxide with a pyrithione salt such as sodium pyrithione to form particles of zinc pyrithione. There is no suggestion in Hani of composite particles wherein the core is, for example, zinc or zinc oxide and the shell contains metal pyrithione including transchelated metal from the core at the core/shell interface as instantly claimed. To the contrary, the patentee discloses the production of discrete particles of zinc pyrithione. Since the Hani et al disclosures do not disclose or suggest the presently claimed invention, a Rule 131 Affidavit to swear behind this reference is respectfully believed to be unnecessary. The teaching of the transchelation from another pyrithione salt to produce zinc pyrithione does not disclose or suggest composite particles having a shell and a core of any kind, much less those as instantly claimed.

The Examiner rejected claims 1, 38, 40, 41, 43 and 44 under 35 USC §102(e) as being anticipated by U.S. Patent No. 6,465,015 to Mohseni, et al. Mohseni et al discloses in Example 1 thereof the use of sonication during the preparation of particles of zinc pyrithione by reacting sodium pyrithione with zinc sulfate. The sonication helps prevent agglomeration of the individual zinc pyrithione particles. There is no suggestion in Mohseni et al of composite particles wherein the core is, for example, zinc or zinc oxide and the shell contains metal pyrithione including transchelated metal from the core at the core/shell interface as instantly claimed. To the contrary, the patentee discloses the production of discrete particles of zinc pyrithione. Since the Mohseni et al disclosures do not disclose or suggest the presently claimed invention, a Rule 131 Affidavit to swear behind this reference is respectfully believed to be unnecessary. The teaching of the transchelation from another pyrithione salt to produce zinc pyrithione does not disclose or suggest composite particles having a shell and a core of any kind, much less those as instantly claimed.

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Rejections under 35 USC §103

The Examiner rejected claims 1, 38 and 40-46 under 35 U.S.C. §103(a) as being obvious and unpatentable in view of Morris, et al., Hani, et al., or Mohseni, et al. and in further view of U.S. Patent No. 5,518,774 to Kappock, et al. Applicants respectfully submit that this rejection is untenable and should be withdrawn.

The Morris et al, Hani et al and Mohseni references have been discussed individually in detail above. Morris et al teaches away from the instantly-claimed product since the common zinc ion disclosed in the zinc pyrithione and zinc oxide components disclosed therein cannot transchelate. Accordingly, the combination of Morris et al, with either Hani et al or Mohseni et al, singly or in combination, is not proper since the combination for purposes of establishing a transchelated product runs counter to the teachings of one of the references sought to be combined namely Morris et al. Hence there is no proper motivation to combine the teachings of the references. The Morris et al product does not envision transchelation, and to infer such based upon the secondary references is in conflict with the requisite common zinc ion of Morris et al. Accordingly, this rejection is untenable and should be withdrawn.

The rejection based upon the combination of Morris, et al. and Kappock, et al. is untenable since the result sought to be achieved by virtue of the combination runs counter to the teachings of the individual references. For example, Morris, et al. teaches away from transchelation of any kind, much less that of the instantly claimed product, by virtue of patentees' disclosure of a common ion (zinc) for the metal and for the pyrithione salt. Contrariwise, Kappock teaches complete transchelation of zinc with a soluble pyrithione salt to produce an insoluble pyrithione salt, namely zinc pyrithione. Accordingly, there is no motivation to combine these references since the teachings of one reference runs counter to the teachings of the other reference. Hence there is no proper motivation to combine the teachings of the references. Accordingly, the rejection of the instant claims based upon that combination is believed to be untenable and should be withdrawn.

Applicants submit that, absent a motivation to combine the references, a prima facie case of obviousness is lacking. For a prima facie case of obviousness to exist, there must be some objective teaching in the art or knowledge generally available to lead one of ordinary skill in the art to combine the references. See *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). Since no

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such motivation has been established by virtue of the outstanding Office Action, it is respectfully asserted that a prima facie case of obviousness has not been established. Further, Applicants submit that none of the references, alone or in combination, anticipate or make obvious the invention as presently claimed and that the application is now in condition for allowance.

None of these references, either alone or in combination, disclose or suggest the biocidal composition of the claims as amended herein. More particularly, none of the references disclose or suggest a biocidal composition comprising composite particles containing a shell and a core, where the core comprises copper or a copper-containing compound as recited in claims 1, 38 and 42. Additionally, none of the references disclose or suggest a biocidal composition comprising composite particles having a shell comprising copper pyrithione. Accordingly, Applicants submit the present rejection is untenable.

In summary, Applicant submits that none of the references, alone or in combination, anticipate or make obvious the invention as presently claimed and that the application is now in condition for allowance. Therefore, Applicant respectfully requests reconsideration and an early receipt of a Notice of Allowance of the instant claims as amended.

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If the Examiner has any questions or believes that a discussion with Applicant's attorney would expedite prosecution, the Examiner is invited and encouraged to contact the undersigned at the telephone number below.

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Respectfully submitted,
David Gavin, et al.

Date: July 18, 2006


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